

A NOTE ON THE PRINCIPAL SYSTEMATIC WORK AND
PUBLICATIONS DEALING WITH THE SOUTH AFRICAN
PROTEACEÆ.

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The Natural Order Proteaceæ is a large group of plants almost exclusively confined to the Southern Hemisphere, being found in Australia, Brazil, Chili, Guiana, New Caledonia, New Zealand, South Africa, Tasmania, but also found in Tropical America and Tropical Africa. The Order is most abundantly represented in Australia and South Africa, but no genus or species is native of both countries; species of *Hakea* and *Grevellia*, however, are cultivated at the Cape, and certain genera, *e.g.*, *Lomatia* and *Orites*, have representatives in both Australia and Chili.

The South African section of the Order, with perhaps the exception of *Brabeium stellatifolium*, Linn., forms a very natural group of plants, and very early attracted the attention, not only of the early botanical collectors, but also of the early navigators by their singular beauty and diversity of form. In 1605 C. Clusius * figures a capitulum of *Protea neriifolia*, which he states was brought from Antolgil Bay, on the east coast of Madagascar, in the year 1597. This locality is evidently an error, as the genus *Protea* is entirely absent from Madagascar, the specimen must have been collected round the slopes of Table Mountain. The above reference and figure is the earliest we have of a member of the Order from South Africa. Leonard Plukenet † figures the Silver Tree (*Leucadendron argenteum*, Linn.), and again in 1696 ‡ makes a reference to "*Leucadendros Africana arbor, &c.*," and refers back to the figure in the *Phytographica*. (The reference to Zanon, "*Arbor ferens folia argentea*," appears to be to an Indian plant and not to *Leucadendron argenteum*.) Plukenet mentions this plant as having been sent from the Cape by Patric Adair, who must therefore have been one of the first Cape botanical collectors. Prior to the year 1700 many Proteaceæ, together with other Cape plants, were sent to the Gardens of Holland by the early Dutch settlers, as Jacob

* C. Clusius, "*Exoticorum Liber Primus*," 1605, p. 39.

† L. Plukenet, "*Phytographica*," 1691, t. 200, fig. 1.

‡ Ibid., "*Almagestum Botanicum*," 1696, p. 212.

Breyne * states that he received a dried specimen of "Frutex æthiopicum conifer, foliis cneori salici æmulus" (our Silver Tree), from Dr. Huybert in 1644 and from Dr. Slade in 1670, these men evidently being in charge of some of the Gardens of that period.

The first important collector sent to the Cape was Francis Masson (1772-73). Being commissioned by Kew, he made an extensive collection of Proteaceæ, many of which now constitute types of Robert Brown's species. Masson was followed by James Niven (1798-1803) as a collector for George Hibbert and the Empress Josephine. Most of his collectings were cultivated in the former's garden at Clapham, and formed the material on which Salisbury, Hibbert's gardener, worked. It is not quite within the scope of this paper to give a list of the collectors following Niven, but reference must be made to Drège, Ecklon, Ludwig, and Zeyher, whose large collections of Proteaceæ enabled Dr. Meisner to make a detailed study of the South African material. Passing mention may be made to the many species collected by the older botanists and still preserved in European herbaria which have not been found since, either having become extinct, or, as is also probably the case, the localities of many species are very restricted, and former hunting grounds have not been revisited by modern collectors. The writer finds this strikingly illustrated in the genus *Sorocephalus*, in which 10 out of the 13 species are only known from type specimens, mostly of Niven's collecting. Many interesting discoveries of long-lost species, however, have been made. *Serruria florida*, Kn., first collected by Thunberg on the French Hoek Mountains, was found again in 1891 by the late Dr. MacOwan; *Protea calocephala*, Meisn., sent to Europe over seventy years ago by Baron von Ludwig, was collected by Dr. J. Muir in the Riversdale District last year; *Protea caffra*, Meisn., last collected by Ecklon and Zeyher on the Magalisberg, was again found by Mrs. Dieterlen near Leribe, Basutoland, in 1910; *Protea neriifolia*, R. Br., was figured in the *Botanical Register* † and recorded from the Cape Peninsula; Dr. MacOwan was the first to rediscover it on the Peninsula in 1881, and the writer found a single plant of this species near Platteklip in April, 1910. It is to be hoped that many more of these lost or little-known species will yet be collected, so as to more fully complete our knowledge of this interesting Order.

The first important systematic publication on the Cape Proteaceæ appeared in 1720, by Hermann Boerhaave, ‡ containing excellent woodcuts of 23 species. Boerhaave divided the Order into the three genera, *Lepi-*

* Jacob Breyne, "Exoticarum, Centuria Prima," 1678.

† *Botanical Register*, t. 203.

‡ H. Boerhaave, "Index Alter Plantarum quæ in Horto Academico Lugduno-Batavo aluntur," 1720.

docarpodendron, *Conocarpodendron*, and *Hypophyllocarpodendron*, composed as follows :—

Lepidocarpodendron contains 10 species of *Protea*, 1 species of *Aulax* (?), 1 species of *Mimetes*.

Conocarpodendron contains 7 species of *Leucadendron*, 1 species of *Protea*, 1 species of *Leucospermum*.

Hypophyllocarpodendron contains 2 species of *Mimetes*.

It will be important to bear in mind the composition of Boerhaave's genera when dealing with the works of Linnæus. The first collection of coloured plates of Proteaceæ appeared in 1745, by Weinmann,* who only recognised one genus, which he called *Scolymocephalus*, and in which he included species of *Protea*, *Leucospermum*, and *Leucadendron*. Between the years 1735 and 1774 appeared the various works of Linnæus, important as introducing the binomial system of nomenclature, but also important from our point of view, as he deals with the Proteaceæ in his Class Tetrangia Monogynia, and was the first author to use the name *Protea*. That Linnæus could not come to a definite conclusion as to the limits of the two genera *Protea* and *Leucadendron* is clearly evidenced in his works if his descriptions and references to Boerhaave's figures are compared, and it may not be out of place to state his views in their chronological order so far as I have been able to determine them.

For the sake of brevity we will denote the genera as follows :—

Conocarpodendron = A.

Hypophyllocarpodendron = B.

Lepidocarpodendron = C.

1. 1735 Syst. Veg. *Protea* = A, B, C.

2. 1735 Hortus Cliffortianus *Protea* = A, B, C.

3. 1737 Genera Plantarum *Protea* = B, C, not A.

4. 1738 Classes Plantarum *Protea* = C.

Leucadendron = A.

5. 1742 Gen. Pl. *Protea* = A (partly).

Leucadendron = A (partly), B, C.

6. 1753 Sp. Pl. *Protea* = A (partly).

Leucadendron = A (partly), B, C.

7. 1754 Gen. Pl. *Protea* = A.

Leucadendron = B, C.

8. 1759 Syst. Veg. *Protea* = A (partly).

Leucadendron = A (partly), B, C.

9. 1762 Sp. Pl. *Protea* = A (partly).

Leucadendron = A (partly), B, C.

* Weinmann, "Phytonthoza-Iconographia," 1745.

10. 1764 Sp. Pl. *Protea* = A (partly).
Leucadendron = A (partly), B, C.
11. 1767 Syst. Nat. *Protea* = A (partly).
Leucadendron = A (partly), B, C.
12. 1770 Syst. Nat. *Protea* = A (partly).
Leucadendron = A (partly), B, C.
13. 1771 Mantissa *Protea* = A, B, C, plus *Leucadendron*.
14. 1774 *Protea* = A, B, C, plus *Leucadendron* and *Aulax*.
15. 1778 Gen. Pl. *Protea* = A, B, C, plus *Leucadendron*.

For further details the reader is referred to an excellent account by Robert Brown* in the preface to his Essay, where the following summary will be found :—

1. He gave the genus *Protea* the same extent which he at length assigned to it in the Mantissa.
2. He limited it, leaving unnoticed that part to which at a later period he exclusively applied to the name.
3. He resumed his first opinions.
4. He subdivided it into two genera, giving them the same names which are adopted in the present Essay (*i.e.*, Brown's Essay).
5. He continued the subdivisions but reversed the names.
6. United them together, thus ending exactly where he commenced.

In 1766 the genus *Aulax* was founded by Bergius,† and in the following year ‡ he published descriptions of 17 species of Proteaceæ all of which he referred to the genus *Leucadendron*, but which consisted of species belonging to various genera. Less important are the works of Jacob Petiver, but as they contain a few figures of Proteaceæ may be mentioned. A considerable advance is marked by the writings of Carl Thunberg,§ the author described 60 species under the name of *Protea*, some of which are still recognised; the text is accompanied by five plates of excellent woodcuts, and for the first time we find species of *Spatalla* and *Sorocephalus* figured. Much useful information as to habits and months of flowering is gleaned from Thunberg's account of the Order, and while his descriptions are not good as a means of determining a species, they are excellent, so far as they go, of the actual specimen which was described. Thunberg again published in 1794 || and dealt with 61 species of *Protea*. An account of the Order was written by

* R. Brown, *Trans. Linn. Soc.*, x. (1810).

† Bergius, "Vet. Acad. Hand. Stock.," 1766.

‡ Ibid., "Descriptiones plantarum ex Capite Bonæ Spei," 1767.

§ C. Thunberg, "Botanico de Protea," 1781.

|| Ibid., "Prodromus Plantarum Capensium," 1794.

Lamark,* and also by Willdenow,† but with the exception of a few novelties there is no advance on Thunberg, and both works are merely compilations of Thunberg's Dissertations on the *Proteaceæ*. In 1804 Poiret‡ published; he goes a step further than Lamark, as a short general description follows each of the 74 species of *Protea* mentioned, but some of the species belong to Australian genera. Between the years 1797 and 1812 appeared various parts of Andrew's "Botanists' Repository," containing coloured plates of species which flowered in cultivation; a few species still recognised were first described in this work. After Thunberg's Dissertations the most important contribution to our subject was by R. A. Salisbury,§ and which marked the founding of several new genera. Salisbury again published in 1809 || under the name of Knight, this publication being the first serious attempt to define and limit the genera in the Order. The material which Salisbury studied was, as pointed out above, mainly collected by Niven and cultivated in Hibbert's garden at Clapham. The collection must have been extensive, as we find 190 species described, which were grouped into 15 genera, viz., *Aulax*, Berg.; *Gissonia*, Salisb.; *Protea*, Linn.; *Euryspermum*, Salisb.; *Chasme*, Salisb.; *Serruria*, Burm.; *Erodendrum*, Salisb.; *Pleuranthe*, Salisb.; *Leucadendron*, Linn.; *Diastella*, Salisb.; *Mimetes*, Salisb.; *Paranomus*, Salisb.; *Sorranthe*, Salisb.; *Spatalla*, Salisb.; *Brabieum*, Linn. The relation of these genera with those recognised by modern botanists will be dealt with when discussing Robert Brown's work. The "*Proteeæ*" has not received the recognition due to it, notwithstanding that it was the first serious scientific account of the Order published, and is useful, as it contains details as to localities and excellent notes on the habits of the various species made by Niven.

The classic work on the *Proteaceæ* was by Robert Brown,¶ who read a paper entitled, "On the *Proteaceæ* of Jussieu," before the Linnæan Society on January 17, 1809. Brown recognised 10 South African genera with 181 species, viz., *Aulax*, Berg.; *Leucadendron* (= *Protea*, *Euryspermum*, *Chasme*, *Gissonia* of Salisbury); *Leucospermum* (= *Leucadendrum*, Salisb.); *Serruria*, Salisb.; *Mimetes* (= *Mimetes* and *Diastella*, of Salisb.); *Nivenia* (= *Paranomus*, Salisb.); *Sorocephalus* (= *Sorranthe*, Salisb.); *Spatalla*, Salisb.; *Brabeium*, Linn. The only differences we find in the limits of the genera of Brown and Salisbury are in *Protea*,

* Lamark, "Illustrationes."

† Willdenow, "Species Plantarum," 1797.

‡ Poiret, "Encyclopedie methodique," 1804.

§ R. A. Salisbury in the "Paradisus Londiensis," 1806, see pl. lxvii.

|| Knight, "The Cultivation of the Plants belonging to the Natural Order *Proteeæ*," 1809.

¶ Trans. Linn. Soc., x. (1810).

Leucadendron, and *Mimetes*, the others are the same except in some cases for a change of name. For objections raised by Brown as to the names *Protea* and *Leucadendron* as used by Salisbury the reader is referred to Brown's original essay.

During the interval elapsing between 1810 and 1856 our knowledge of the Order was practically at a standstill. In 1813 Thunberg* published, enumerating 80 species of *Protea*; another edition† of the same work was published in 1818, but with no advance on the former. The first authors to take up Brown's genera were Romer and Schultes,‡ who described 167 species of Proteaceæ, but omitted the two dioecious genera, *Aulax* and *Leucadendron*. Although the descriptions are merely copies of Brown's and no new localities are given, yet we find here the first serious attempt to sweep together the existing synonyms. A third edition§ of Thunberg's "Flora Capensis," edited by Schultes, appeared in 1823, but notwithstanding it was published thirteen years after Brown, only the genus *Protea* with 84 species is mentioned. Two years later Sprengel|| published and described 134 species of Proteaceæ (33 less than Romer and Schultes), but he included the genera *Aulax* and *Leucadendron* in the Linnæan class *Tetrandria monogynia*. These two genera, as pointed out above, were omitted by Romer and Schultes. This work is not of much importance, as the descriptions are merely compilations from Brown. In the following year Nees von Esenbeck¶ published a copy of Brown's essay, and three years later Link** gave descriptions of 2 species of *Leucadendron*, 3 species of *Protea*, and 1 species of *Serruria*. An account of the Order Proteaceæ with a list of genera by Bartling†† appeared in 1830, but is not of much importance. In 1835 Reichenbach‡‡ published four coloured plates of *Protea* with descriptions. This work is merely mentioned on account of the plates it contains. An important publication was that by Harvey§§ in 1838, who gave a good key to the genera based principally on the form of the inflorescence; two years previously the affinities of the Proteaceæ were discussed by Lindley.|||| A short account of the Order which may be noted was that by Ed. Spach¶¶

* Thunberg, "Flora Capensis," 1813. † Thunberg, "Flora Capensis," 1818.

‡ Romer and Schultes, "Syst. Veg." iii., 1818.

§ Thunberg, "Flora Capensis," ed. Schultes, 1823.

|| Sprengel, "Syst. Veg.," 1825.

¶ Nees von Esenbeck "Robert Brown's Vermischte Botanische Schriften," ii., 55, 1826.

** D. H. F. Link, "Handbuch zur Erkennung, i., 382, 1829.

†† Fr. Th. Bartling, "Ordines Naturales Plantarum," pp. 115-118.

‡‡ Reichenbach, "Flora Exotica," 1835.

§§ Harvey, "Genera of South African Plants," ed. i., 1838.

|||| J. Lindley, "Natural System of Botany," pp. 197-200, 1836.

¶¶ Ed. Spach, "Histoire Naturelle des Vegetaux," vol. x., pp. 398-433, 1841.

in 1841. In 1843 Dr. Ernst Meyer edited Drège's "Zwei Pflanzen-geographische, which while merely an enumeration of the plants collected by Drège, is of importance on account of the localities, altitudes, and months of flowering of the Proteaceæ which are scattered throughout the work. Almost simultaneous with this publication was a list of the Proteaceæ* collected by Zeyer and Ecklon, compiled by the former. Another list of those collected by Krauss appeared in 1844,† and was again reprinted in 1846.‡ A new genus, viz., *Faurea*, was described by Harvey in Hooker's "London Journal of Botany," representatives of which have since been found to occur in Madagascar. This fact is mentioned as Brown was struck by the absence of the Order from the island. The following year saw another new genus described, viz., *Orothamnus*, by Pappe, in the *Botanical Magazine*, t. 4357.

To bring all the scattered information on the Proteaceæ together was left to a German botanist, Dr. Meisner.§ Meisner followed Brown and adopted his genera, he included Harvey's new genus *Faurea*, but united Pappe's *Orothamnus* with *Mimetes*, R. Br., though keeping it in a separate section. He gave descriptions of 279 species, many of them new. It is due principally to the labours of Drège, Ecklon, Zeyher, Ludwig, and Krauss, who sent large quantities of material to Europe, that the South African members of the Order were so ably dealt with by Meisner, and his work remains up to the present the standard one. The second edition of Harvey's "Genera of South African Plants" appeared in 1868; the writer has taken Harvey's key as a model in preparing a key to the genera for the "Flora Capensis." The same year the Ray Society published "The Miscellaneous Botanical Works of Robert Brown,|| among which will be found a reprint of Brown's monograph, which originally appeared in the Transactions of the Linnæan Society. In 1880 Bentham and Hooker published their "Genera Plantarum" with an excellent key and generic characters. This was followed in 1889 by an account of the Order by Engler.¶ An attempt was made by Otto Kuntze** to re-establish old generic names, but with regard to the South African Proteaceæ at least the scheme failed, and the names of the genera have now been decided upon by the Vienna Congress in 1905. The writer may mention, however, that if *Protea*, R. Br. is to be one of the *nomina conservanda* in preference to *Protea*, Linn., or *Protea*, Salisb., then *Leucadendron*, Berg., should be omitted, as *Protea*, R. Br. is as much *Protea*, Linn., as *Leuca-*

* "Linnea," xx., pp. 204-207.

† "Flora" (1844), pp. 74-77.

‡ Krauss, "Beiträge zur Flora des Cap-und Natallandes," 1846, pp. 138-141.

§ "D. C. Prodr.," xiv., 1856, pp. 209-482.

|| Vol. ii., pp. 3-192.

¶ Engler in "Engler and Prantl Pflanzenfamilien," III., i.

** Otto Kuntze, "Revisio Generum Plantarum," 1891.

dendron, R. Br., is *Leucadendron*, Berg. In passing the various descriptions and plates which appeared at odd times in the *Botanical Magazine* and the *Botanical Register* may be noted.

The writer had been paying some attention to the South African Proteaceæ, and in 1910 undertook to monograph the Order for the "Flora Capensis." A vast amount of material had accumulated since Meisner's work appeared in 1856, a large percentage of which was new. Descriptions of new species have appeared in various numbers of the *Kew Bulletin*, and a description of a new genus will be found in the same publication. The genus *Diastella*, Salisb.,* has been taken out of *Mimetes*, R. Br., where it was placed by Meisner and given a generic status; *Orothamnus*, Pappe, will also be kept as a distinct genus. The separation of *Mimetes* as recognised by Meisner into the three genera *Mimetes*, R. Br., *Diastella*, Salisb., and *Orothamnus*, Pappe, and the establishing of the new genus *Spatallopsis*, Phillips,† brings up the number of the South African genera of Proteaceæ to 13.

In conclusion, and as a short summary of what has been said above, we find that there are four distinct stages in the advance of our knowledge of the South African Proteaceæ. The first was Boerhaave's publication in 1820, a serious beginning to the systematic work on the Order. Next followed Linnæus, who put systematic botany on a firm basis by the introduction of his binomial nomenclature. Salisbury and Brown mark a very distinct advance, as it was only then that the genera came to be recognised, and lastly it is due to Meisner, who enlarged on Brown and brought together all which had been published by previous authors, that our present knowledge of the Order is what it is to-day.

The writer takes this opportunity of thanking Dr. Otto Stapf, F.R.S., for kindly help which was given in looking up references in the older literature.

* The genus *Diastella*, *Journ. of Bot.*, vol. xliv., No. 577, p. 28.

† *Spatallopsis*, a new genus of Proteaceæ, *Kew Bull.*, 1910, No. 8.